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ABSTRACT

This paper looks into the theory, and the practice of Management Information Systems (MIS) in the university setting, suggesting that university administrators are often more interested in "soft" information than "hard" information provided by MIS. Attitudes of university administrators are discussed, as well as management styles, supporting the concept that university situations cannot be treated as businesses except in such areas of the university environment as the bursar, registrar, and admissions. The information needs of university managers are also discussed. A description of how the MIS system is used at Pepperdine University is included in two sections which identify hard and soft data scurces. Recommendations for initiating MIS in a university setting include the establishment of information objectives for institutions; use of those objectives to determine type or mix of data information needs analyses to be conducted; conduct of such analyses; and design and development of the information system that is "right" for the institution/situation. JEG)

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MIS IN A NON-MIS (UNIVERSITY) ENVIRONMENT

by

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MIS IN A NON-MIS (UNIVERSITY) ENVIRONMENT

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The major roles of the manager (described in "The Manager's Job: Folklore and Fact," by Henry Mintzberg, Harvard Business Review: Stress, Success...and Survival, 1976) of figurehead, leader, liaison, monitor, disseminator, spokesman, entrepreneur, disturbance handler, resource handler, and negotiator do not appear to be well supported by traditional MIS concepts and practices.

The typical tools we have brought to bear on management support functions are exemplified by data bases, retrieval software, report generators, modeling, etcetera. Given the attention and resources MIS has received over the past decade, why is gossip and other "soft" information cherished more by managers than the "hard" MIS information we provide? Is this a problem or a symptom? Can/should those of us who impact MIS concepts and design react to the situation?

This paper focuses on the implications of the issue outlined above and follows with some alternative proposals and reactions currently or near-future available.

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Introduction

If one looks at available literature over the last ten years or the last ten months, few topics have generated more print than that of Management Information Systems (MIS). MIS has been defined (eighteen somewhat different definitions were listed in one book), divined, and defiled. It has been written about by experts and novices, by educators and businessmen, and by bureaucrats and technocrats. Still it is safe to say that a consensus agreement as to what it is supposed to be, what it is, or its worthwhileness has not been reached.

This paper attempts to examine the MIS concept from the perspective of certain commonly held assumptions about management and, thus, about what MIS is designed to do versus what the manager actually does. This concept, the authors believe, leads to an expectations gap, particularly in a University setting. Although hard and fast answers are not proposed, some suggestions are set forth as to how this expectations gap might be narrowed if not closed.

What is Management?

> The term (management) encompasses not only the process itself by which the basic functions of running an enterprise are performed but also the people who administer this process.
>
> When management is used within the first context, the functions encompassed are generally the classical ones as expounded by Henri Fayol: planning, organizing, staffing, directing and controlling. When used within the second context, the term includes not only those who make use of the DP (Data Processing) resource, but also those who oversee the process which ensures that the users make effective use of the resource.[1]

This statement is current (published in June 1978) and typical of management vocabulary. The words may be changed slightly as Drucker does in setting forth his "Five Basic Operations of Management": (1) setting goals and objectives (planning), (2) organizing (organizing), (3) developing

people (staffing), (4) motivating and communicating (directing), and (5) measurement (controlling).[2] However, the "bottom line" continues to be basically the same as that introduced by the French Industrialist in 1916.

The Typical MIS

In developing the framework for a MIS, it is not uncommon to first define the functions of management, secondly define information, and finally to define a system. Once this is done, the three definitions are integrated and intermingled into a definition of MIS. Given that management has been defined, a typical scenario follows:

> Next, what does "information" mean? The terms information and data are often used interchangeably. But, there is significant difference between these two terms.
>
> Data is (sic) the basic representation of an event. It is our raw input. It is what we start with. Data is the raw material from which information is developed. Data is transformed into information through an infusion of purposeful intelligence, so that it (information) communicates knowledge to help the user arrive at decisions for proper execution of the functions in the management process.
>
> In other words, information is data that has been culled, analyzed, interpreted and presented on a selective basis in a format that aids the understanding of the situation and that fosters the making of better decisions (than without it). But, because management must perform many different functions, information at one level of usage may only be data at another level...
>
> What does the term "system" mean?...
>
> (One) way to define the term is by considering it in a chain of events. There are inputs into a process; there is a processor that does one or more operations over the inputs; there are outputs from the processor to serve as new inputs to other processors or to be used directly for feedback; there are controls for monitoring the ongoing performance of the processor by comparing the outputs to some predefined standards; and there is the feedback loop which reacts to deviations between the output and control standards so as to maintain the established limits of the imposed controls...

> ...we can finally pull it all together to define MIS as: A system designed to provide to management, useful information in the necessary timeframe to make decisions and to take effective action in planning, staffing, directing and controlling the resources used in the general conduct of an enterprise.[3]

The process just described and its resultant relationship to the management of an institution is well represented by the diagram in the appendix (see Figure 1).

MIS Expectations

> All that top management wants from a management information system is exactly enough of the most relevent information at precisely the right moment to produce an infallible management decision--and, of course, at the least possible cost.[4]

Although this quote may be somewhat an overstatement, the article from which it was taken goes on to list five criteria which any MIS must meet: (1) uniformity of definitions, formats, policies, etc., (2) timely information, (3) total integration with the organization's established accounting system, (4) flexibility, and (5) conciseness of information.[5]

Implied expectations resultant from this "must meet" list are obvious; it is possible to get all of what top management wants.

Needless to say, documented evidence that anyone has ever been successful in meeting or even in coming near to meeting such expectations over any extended period of time are difficult to find. Conversely, evidence of great disappointments are plentiful and calls for the abandonment of the MIS concept are not unheard.

The University MIS

> ...usually (being) in the position of explaining why we needed money or how we had spent money. One of the refrains I heard over and over was, "Why can't you people in higher education manage your affairs more efficiently? Why don't you use modern management techniques like we do?"[6].

This is a quotation from a recent article by an individual who left

the academic setting where he had been a dean and a provost to become a "real" executive in the business world. (More will be said later about his observations.) It is illustrative of the general attitude without and to a great degree within the higher education arena.

Discussions of the differences between administration and management by Gardner and Parker[7] and academic administrators versus non-academic administrators by Powers[8] point out very well that there are legitimate differences (1) between the way to "run" a business and the way to "run" an institution of higher learning, and (2) between the administration of academic (departmental chairpersons and deans) positions and non-academic positions (business office, registrar, admissions, etc.) within a college or university.

This paper supports the thesis that a MIS in any setting, university or otherwise, must be designed to support the true management/administration needs of the particular institution. It must also ask if this has been the real objective or perhaps more appropriately, if it has been the objective, has it in fact slipped into a design to meet theoretical functions of management so predominant in the literature?

More must be said about the attitudinal assumption that "business" management is somehow "better" than educational administration. The observations, previously mentioned, by a former dean who is now a business executive follow:

> ...I would suggest that academic management is second to none in making the best use of existing resources. The average academic middle manager--dean, business officer, physical-plant manager--can get more per dollar spent than the corporate manager by half whether the resource in question be services, facilities, equipment, or supplies...

> In summary, academic managers have a far better track record in maximizing resources than do corporate managers.
>
> Second, I would suggest that corporate managers are far superior to academic managers in maximizing revenues. We are talking here about marketing, advertising, distribution, and financing. Nowhere is the difference between the academic and business subcultures more striking than at this point. Business is active, academe passive. Business is goal-oriented, academe survival-oriented. Business managers plan, monitor, pressure, and orient their entire system of management toward sales and revenues. Academe leaves the generation of revenue to a few "outsiders" in the development, business, and admissions offices...
>
> A final word. In their daily lives, academic and corporate managers would find many similarities if they could compare roles. Most organizations today are dominated by "groupthink," and the political skills necessary to succeed in either environment are applicable to the other. The jargon and the buzzwords differ somewhat and so do the conventions. But there are more similarities than differences.[9]

If there is merit in the comments just quoted, there may be worth in exploring the supposition that whatever is wrong with MIS in the university setting may also be wrong in the business setting and that the common element may be an inappropriate perspective of what managers/administrators really do.

The Managers Job: A Different View

> The field of management, so devoted to progress and change, has for more than half a century not seriously addressed the basic question: What do managers do? Without a proper answer, how can we teach management? How can we design planning or information systems for managers? How can we improve the practice of management at all?[10]

Mintzberg attempts to shed some light on the questions he raises by listing what he considers to be folklore and fact regarding what managers (he uses the term in the broadest sense) actually do.

1. Folklore: The manager is a reflective systematic planner. The evidence on this issue is overwhelming, but not a shred of it supports this statement...

   Fact: Study after study has shown that managers work at

an unrelenting pace, that their activities are characterized by brevity, variety and discontinuity, and that they are strongly oriented to action and dislike reflective activities.

2. Folklore: The effective manager has no regular duties to perform. Managers are constantly being told to spend more time planning and delegating, and less time seeing customers and engaging in negotiations. These are not, after all, the true tasks of the manager. To use the popular analogy, the good manager, like the good conductor, carefully orchestrates everything in advance then sits back to enjoy the fruits of his labor, responding occasionally to an unforeseeable exception.

   Fact: In addition to handling exceptions, managerial work involves performing a number of regular duties, including ritual and ceremony, negotiations, and processing of soft information that links the organization with its environment.

3. Folklore: The senior manager needs adjustment information, which a formal management information system best provides. Not too long ago, the words total information system were everywhere in the management literature. In keeping with the classical view of the manager as that individual perched on the apex of a regulated, hierarchical system, the literature's manager was to receive all his important information from a giant, comprehensive MIS...

   Fact: Managers strongly favor the verbal media--namely, telephone calls and meetings. The evidence comes from every single study of managerial work...

4. Folklore: Management is, or at least is quickly becoming, a science and a profession. By almost any definitions of science and profession, this statement is false...

   Fact: The managers' programs--to schedule time, process information, make decisions, and so on--remain locked deep inside their brains. Thus, to describe these programs, we rely on words like judgment and intuition, seldom stopping to realize that they are merely labels for our ignorance.[11]

Figure 2 (in the appendix) outlines ten roles of the manager, which according to Mintzberg, are much more realistic than the classical functions listed by Fayol and discussed earlier.

Three of the manager's roles arise directly from his formal authority and involve basic interpersonal relationships.

1. First is the figurehead role. By virtue of his position as head of an organizational unit, every manager must perform some duties of a ceremonial nature.

   Duties that involve interpersonal roles may sometimes be routine involving little serious communication and no important decision making. Nevertheless, they are important to the smooth functioning of an organization and cannot be ignored by the manager.

2. Because he is in charge of an organizational unit, the manager is responsible for the work of the people of that unit. His actions in this regard constitutes (sic) the leader role. Some of these actions involve leadership directly--for example, in most organizations the manager is normally responsible for hiring and training his own staff.

   In addition, there is the indirect exercise of the leader role. Every manager must motivate and encourage his employees, somehow reconciling their individual needs with the goals of the organization.

3. The literature of management has always recognized the leader role, particularly those aspects of it related to motivation. In comparison, until recently it has hardly mentioned the liaison role, in which the manager makes contacts outside his vertical chain of command. This is remarkable in light of the finding of virtually every study of managerial work that managers spend as much time with peers and other people outside their units as they do with their own subordinates--and, surprisingly, very little time with their own superiors...

   The processing of information is a key part of the manager's job.

   The manager does not leave meetings or hang up the telephone in order to get back to work. In large part, communication is his work. Three roles describe these informational aspects of managerial work.

1. As monitor, the manager perpetually scans his environment for information, interrogates his liaison contacts and his subordinates, and receives unsolicited information, much of it as a result of the network of personal contacts he has developed.

2. He must share and distribute much of this information. Information he gleans from outside personal contacts may be needed within his organization. In his disseminator role, the manager passes some of his privileged information directly to his subordinates, who would otherwise have no access to it. When his subordinates lack easy contact with one another, the manager will sometimes pass information from one to another.

3. In his spokesman role, the manager sends some of his information to people outside his unit--a president makes a speech to lobby for an organization cause, or a foreman suggests a product modification to a supplier. In addition, as part of his role as spokesman, every manager must inform and satisfy the influential people who control his organizational unit...

Information is not, of course, an end in itself; it is the basic input to decision making. One thing is clear in the study of managerial work: the manager plays the major role in his unit's decision-making system. As its formal authority, only he can commit the unit to important new courses of action; and as its nerve center, only he has full and current information to make the set of decisions that determines the unit's strategy. Four roles describe the manager as decision-maker.

1. As entrepreneur, the manager seeks to improve his unit, to adapt it to changing conditions in the environment. In his monitor role, the president is constantly on the lookout for new ideas. When a good one appears, he initiates a development project that he may supervise himself or delegate to an employee (perhaps with the stipulation that he must approve the final proposal)...

2. While the entrepreneur role describes the manager as the voluntary initiator of change, the disturbance handler role depicts the manager involuntarily responding to pressures. Here change is beyond the manager's control. He must act because the pressures of the situation are too severe to be ignored: a strike looms, a major customer has gone bankrupt, or a supplier reneges on his contract...

3. The third decisional role is that of resource allocator. To the manager falls the responsibility of deciding who will get what in his organizational unit. Perhaps the most important resource the manager allocates is his own time.

4. The final decisional role is that of negotiator. Studies of managerial work at all levels indicate that managers spend considerable time in negotiations: ...They are an integral part of his job, for only he has the authority

to commit organizational resources in "real time," and only he has the nerve center information that important negotiations require.[12]

These managerial roles, the authors believe, describe the process of administration, academic and non-academic, as well as the process of management. It follows then that those involved in the design of a MIS might get a better fit in meeting needs if these managerial roles, within the context of a particular institution, are used rather than the classical functions of managers as cornerstones of the system.

What Are the Data/Information Needs of University Managers?

Perhaps the best way to address the question "What are the data/information needs...etc?" is with a short analogy; managers value performance measures as management tools. In the absence of performance standards, however, measurements are little more than intellectual calisthenics. In a similar manner, constructing a management data/information needs listing in the absence of qualified management objectives, is a futile effort. The premises upon which much of the following rest, include the assumption that formal objectives will exist as management decisions are made. That this is almost invariably an erroneous assumption should be emphatically noted! Malcolm Munro, at Calgary University reflects ..."determining the information each manager needs is a particularly difficult task, in fact it is generally recognized to be one of the most difficult phases in the development of Management Information Systems (MIS)."[13] Based on the expressed high level of dissatisfaction so many schools experience with their MIS, one must be highly suspicious of the methodology employed in needs analyses at the beginning of systems development efforts. Before examining alternative approaches to these analyses, it might be well to reiterate to newcomers to

the profession the difference between data and information. Data are facts that may or may not be meaningful and/or related; information consists of (usually) facts that convey meaning and/or context. The origin of the following illustration of the data/information distinguishing features may be lost in E.D.P. archives, but was first heard by the authors as Charles R. Thomas, Executive Director of CAUSE, spoke to a seminar of Community College executives--"if you tell me how not to do something, that's data; if I had been going to do it that way, that's information."

Data and Information Needs Analysis

It is the opinion of the authors that failure to adequately address the question of needs analyses is a key factor that puts universities in the category of environments into which MIS is the abbreviation for misfit. Unlike(?) a business, an institution of higher education is just as likely to ask "What do we want?" as it is to ask analytically "What do we need?." Those of us in data processing management roles can aid our institutions in recognizing this problem but the problem here is, after all, one of attitude. We are about as likely to be 100 percent successful in this venture as we would be in convincing the executive to change political parties! The veracity of this observation becomes more apparent as we get to topics such as (1) hard and soft data and (2) the sources of information used in much of the management decision-making process.

For the present, let us look at two methods commonly employed in the determination of a manager's information needs (from the article by Munro, already cited, see Figure 1 in the appendix).

The most obvious difference between the models, other than their approach to the problem, is the fact model B takes into account company/university policy, procedure, and organizational structure. It may be appropriate

to assume the decision analysis method would bring us closer to an information oriented, and the data analysis method to a data oriented system, or MIS versus MDS (management data systems), the latter being inherently a contradiction in terms.[14]

Who?

Beyond the methodology employed in the analysis, who (all) should determine needs? The fact that there's no such thing as an "ideal" or an "average" user makes the information analyst's job even more difficult than it would be otherwise. Too many times we see a system developed by "averaging" several managers' input; in doing this, we insure a system that pleases nobody! An editorial in Infosystems (November 1978) recently lamented the futility of involving users in systems defining and development, saying, "Management training in MIS is at the leading edge of any training program, but it can turn too easily to the bleeding edge for the MIS director who strongly suggests many (user) hours of involvement."[15] An infrequently discussed problem for many executives is the middle managers propensity to want to maintain an element of mystery regarding how he or she solves problems; the manager who will only discuss the results of decision-making activities can make the job of the systems development officer a nightmare. As a compounding factor in this dilemma, George Mueller, of SDC points out a major communications problem most of us have experienced--"Most programmers don't understand complex business (we can substitute university) functions any better than top executives understand programming."[16] Most of us acknowledge the fact programmers speak a unique language and have a unique perspective but fail to acknowledge the same of university administration and administrators. Given, then, the difficulties in establishing data needs and the limiting characteristics of human resources,

it should be clear we must start our quest for the "perfect" system by having a new (to universities) "hybrid"-type administrator look at information needs by performing analyses of decisions flow(s) and from these exercises work backwards towards needs. The authors defined this individual in a recent CAUSE publication as the Data Base Administrator.[17] When effective coordination exists, "no (information) system can replace effective line managers";[18] a good DBA will assume the responsibility for this coordination.

Data/Information Types and Sources

To a major extent, the needs analyses methods employed determine the sources and the sequence of investigating those sources of data and/or information. Given the luxury of adequate time for so doing; it seems some combination of analyses would minimize the potential for source oversights. Regardless of approach used, the end result of the exercise will be several dozens-to-a-few-hundreds hard data elements and a few needs and sources impressions; impressions that will, in part, at some near future date help in determining such things as sort hierarchies and page break criteria. The remainder of the "impression information" could be labeled soft information. The article by Mintzberg, referenced earlier, elaborates on the role of soft information in decision-making cycles and reports "...the strategic data bank of (an) organization is not in the memory of its computers (hard data/information) but in the minds of its managers (soft data/information)."[19]

To complete the scavenger hunt for data and information sources then, one needs to address the traditional sources including input/output forms and reports and existing data element dictionaries and files, as well as the sources implied by the decision analysis method model. Additionally, one needs to be attuned to "sounds" of soft information paths. The ability to

do this typically comes with quality experience in a specific institution or company as the sources and their relative importance will undoubtedly vary place-to-place and time-to-time within a given place. In any case, neither data/information needs nor sources analyses can be successfully concluded in the absence of generally agreed upon information and organization objectives.

One Institution's Approach to a "Mintzberg MIS"

It is unfortunate the Mintzberg article or the work done by Gardner and Parker was not available when early MIS planning and design work occurred at Pepperdine University; not that the ultimate destination would have been all that different but, the authors agree, the route would certainly have been more direct. In the context of this paper, our work is sorted into two parts.

A. Hard Data Sources/Information Channels.

In planning for what later became known as "hard" data/information, the University used four related sources:

(1) An Institutional Research (IR) Module,

(2) Mark IV and Mark IV Auditor,

(3) A Retrieval Module, and

(4) Routine Production Reports (DP and IR output).

Numbers three, four, and Mark IV Auditor are necessary for efficient performances of day-to-day, routine activities. These resources are primarily data assembly tools for middle management and supervisory level staff members. Upper management may occasionally use something from these sources but, if so, it is necessarily as a "snapshot" view of the situation. Our use of the IR and Mark IV software approaches the "ideal" management information resource, i.e., these tools are used in information gathering,

long-range planning, historical comparisons/perspective, and for hard data based decision-making activities. In tandum, these data/information sources appear to be satisfying the university's needs of the late 1970's; in the absence of a formal and comprehensive institutional information policy, and given 1980 needs may be significantly altered from those of today, the flexibility afforded by the referenced sources appears to meet current and anticipated needs very well.

B. Soft Data Sources/Information Channels.

While we must acknowledge most soft data and/or information is transferred through almost exclusively informal channels, some planned structures and activities are possible. At Pepperdine University we use:

(1) Committee Structure,

(2) Systems Coordinators,

(3) The Data Base Administrator (DBA) Function, and

(4) "Informal" Modes (DBA meetings, VP interfaces, deans/systems users meetings, etc.).

In our previously mentioned publication (see footnote 17), we discussed the role of our Records Advisory Committees (student and business), since combined to form an Administrative Records Advisory Committee, our User Task Forces, Systems Seminars, etcetera; we also described the role of User Liaison positions. Some elaboration on the evolution of these latter functions might indicate where we are going in the information systems scheme of things. The User Liaison positions have been redefined and are now called Systems Coordinator positions, two for business systems, two for student systems-related activities. Initially the primary function was the collection and evaluation of the "soft" information/decision

elements of our systems community, with maybe 33-40 percent time and talent spent on the technical aspects of needs and development. Today, the situation is almost exactly reversed, with something like 66-75 percent of activities being in the analytical and/or technical mode. The point is, once the assessment of soft needs and resources has been identified, maintenance requires fewer (though consistent application of) resources.

Through the Vice President for University Systems, any dean or "major" systems user can convene a monthly meeting of the deans and systems users group (about ten members, total). The purpose--discussion, not of hard operational events, but the eliciting and disseminating of soft data/information/issues. The weekly meetings of the senior administrative staff serve, in part, the same function.

While these activities are not generally a part of any computer file, needs and resources identifications are enhanced.

Observations and Conclusions

A major reason for stressing the presence of objectives prior to going on with an information needs analysis is their availability for use as input in assessing the level of management anticipated (according to stated objectives) by the organization. This procedural methodology minimizes the likelihood of individuals in our profession designing and developing a management information system when the organizational objective(s) call for administrative information system (see figure 4), or some degree of hybridization.

From the Gardner/Parker article and the materials referenced in the Chronicle of Higher Education, universities appear more to manage well day-to-day, i.e., procedures/resources, than to plan or project effectively.

But it is clear that forms of management and planning do take place and while it is likely there is no ideal or average mix of hard and soft support data/information, there likely is an ideal combination for a specific institution or organization. In none of the materials reviewed was found an individual or organization using 100 percent hard or soft source data, or utilizing a 100 percent management or a 100 percent administrative approach to objectives meeting. At Pepperdine University, we use hard data for tracking purposes, e.g., enrollments, budget, personnel turnover, etcetera, and a combination of hard and soft information for planning purposes. We do not have elaborate systems resources for getting as sophisticated as many need or want to get in either tracking or planning, but the resource(s) seem adequate for our institution as we approach 1980. Since we have developed no optimum system "shelf life," since systems are not covered in our retention schedules, and since most of the planning/design work for the integrated elements of our system were planned and designed in 1975 and 1976, we feel the MIS/AIS model mix at Pepperdine University has been successful.

In summary, the following points seem worth reviewing:

(1) The typical MIS is based on Fayol's 1916 definition of the functions of management.

(2) Businesses as well as universities have had their share of MIS woes, therefore, lack of "businesslike" management practice by universities is not the reason for MIS problems.

(3) A different look at what managers do, i.e., Mintzberg, leads to a different view of MIS design.

The authors would suggest:

(4) Establishment of information objectives for the institutions.

(5) Using the objectives, determine type (data or decision) or mix of data/information needs analyses to be conducted.

(6) Conduct such analyses.

(7) Design and develop the information system that is "right" for the institution/situation.

Gook Luck!

FOOTNOTES

[1] Katch, David, "What is a Management Information System?," Infosystems, June 1978, p. 94.

[2] Drucker, Peter F., Management: Tasks, Responsibilities, Practices, Harper and Row, New York, 1974, p. 400.

[3] Katch, pp. 94-96.

[4] Spencer, William I., "What do Upper Executives Want From MIS?," Administrative Management, July 1978, p. 26.

[5] Ibid., p. 27.

[6] Fedewa, Lawrence J., "How Efficient Are Colleges?," The Chronicle of Higher Education, November 20, 1978, p. 48.

[7] Gardner, Don E. and Parker, John D., "MIS in Higher Education: A Reassessment," CAUSE/EFFECT, May 1978, pp. 10-13, 16, 17.

[8] Powers, Michael J., "A Management Information System for Academic Administrators," AEDS Journal, Summer 1978, pp. 97-106.

[9] Fedewa, p. 48.

[10] Mintzberg, Henry, "The Manager's Job: Folklore and Fact," Stress, Success...and Survival, Harvard Business Review, 1976, pp. 111-123.

[11] Ibid., pp. 116-121.

[12] Ibid.

[13] Munro, Malcolm C., "Determining the Manager's Information Needs," Journal of Systems Management, June 1978, p. 34.

[14] Katch, pp. 94, 96, 98.

[15] Kneitel, Arnold M., "The Futility of User Involvement," Infosystems, November 1978, p. 92.

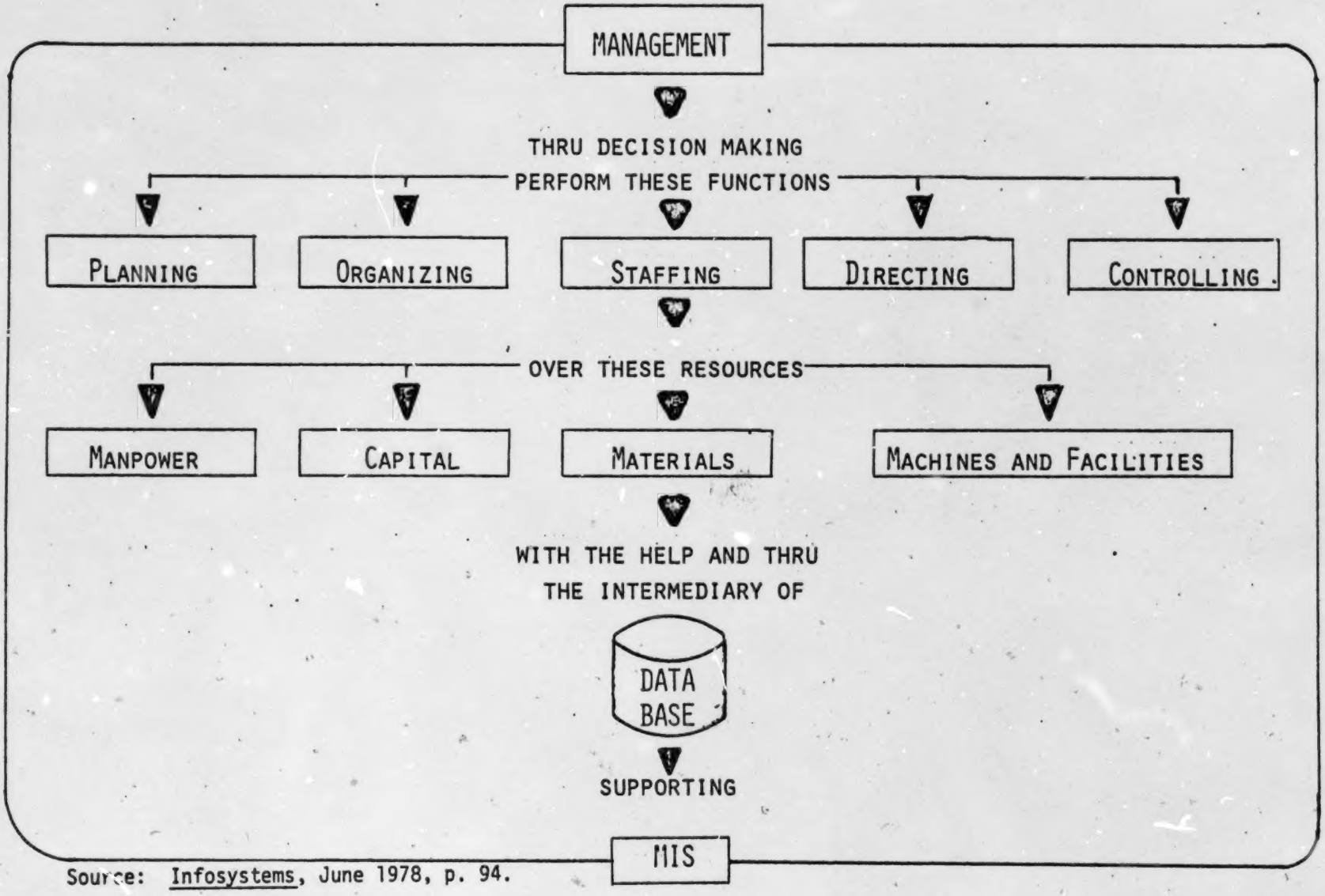
[16] Mueller, George E., "Blueprinting a Workable MIS," Administrative Management, September 1978, p. 25.

[17] Penrod, James I. and Craft, Larry N., "Thinking New System(s)? Some Action Items," CAUSE/EFFECT, September 1978, p. 18.

[18] Spencer, p. 68.

[19] Mintzberg, p. 114.

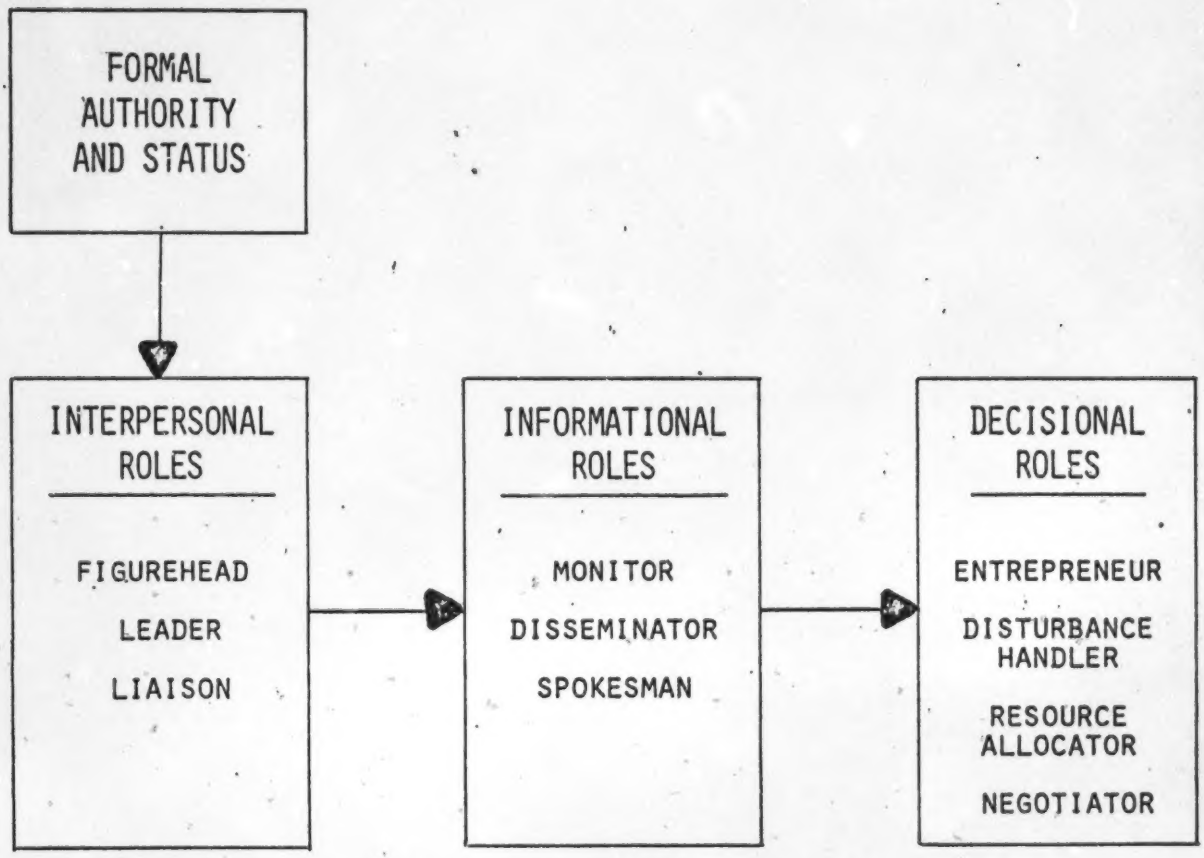
Appendix - Figure 1



Source: Infosystems, June 1978, p. 94.

Appendix - Figure 2

THE MANAGER'S ROLES



Source: Stress, Success...and Survival, Harvard Business Review, 1976.

APPENDIX - FIGURE 3

A. DATA ANALYSIS METHOD

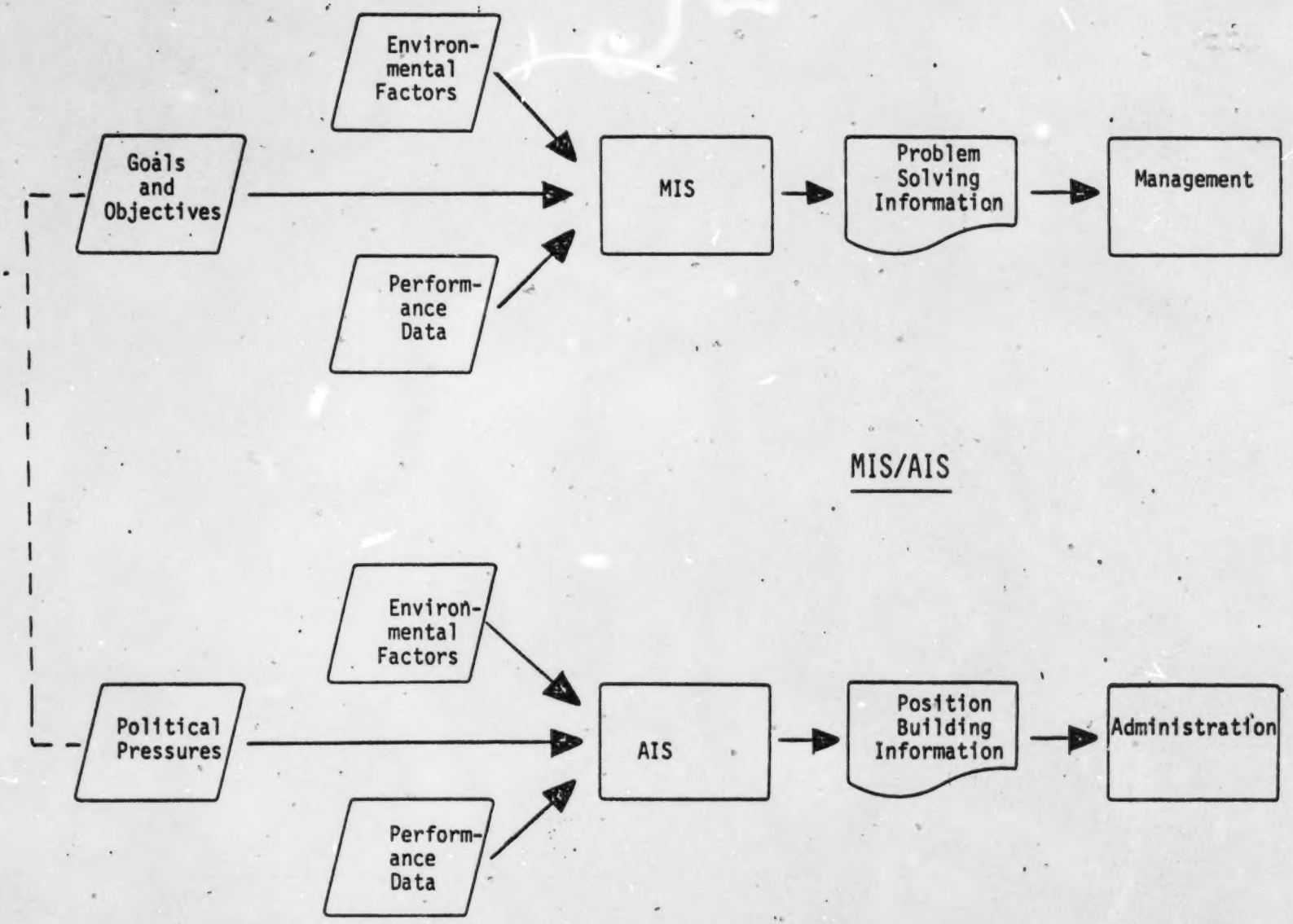
1. EXAMINE ALL REPORTS, FILES, AND OTHER INFORMATION SOURCES DRAWN UPON BY THE MANAGER.
2. DISCUSS WITH THE MANAGER THE USE OF EACH PIECE OF INFORMATION EXAMINED.
3. ELIMINATE UNNECESSARY INFORMATION.
4. DETERMINE UNSATISFIED INFORMATION NEEDS THROUGH INTERACTION WITH THE MANAGER.

B. DECISION ANALYSIS METHOD

1. DETERMINE MAJOR DECISION RESPONSIBILITIES THROUGH DISCUSSION WITH THE MANAGER.
2. DETERMINE POLICY AND ORGANIZATIONAL OBJECTIVES RELEVANT TO DECISION AREAS IDENTIFIED.
3. DETERMINE SPECIFIC STEPS REQUIRED TO COMPLETE EACH MAJOR DECISION.
4. DEVELOP A MODEL (FLOW CHART) OF EACH DECISION.
5. EXAMINE FLOW CHART TO DETERMINE INFORMATION REQUIRED AT EACH STEP IN THE DECISION.

SOURCE: JOURNAL OF SYSTEMS MANAGEMENT, JUNE 1978, PP. 35, 36.

Appendix - Figure 4



Source: CAUSE/EFFECT, May 1978, p. 17.

FIVE BASIC OPERATIONS OF MANAGEMENT

FAYOL (1916)	DRUCKER (1974)
PLANNING	SETTING GOALS AND OBJECTIVES
ORGANIZING	ORGANIZING
STAFFING	MOTIVATING AND COMMUNICATING
DIRECTING	MEASUREMENT
CONTROLLING	DEVELOPING PEOPLE

DATA SOURCES

HARD	SOFT
1) An Institutional Research IR Module	1) Committee Structure
2) Mark IV and Mark IV Auditor	2) Systems Coordinators
3) A Retrieval Module	3) The Data Base Administrator (DBA) function
4) Routine Production Reports (DP and IR output)	4) "Informal" modes (DBA meetings, VP interfaces, deans/systems users meetings, etc.

FOLKLORE	FACT
The manager is a reflective systematic planner. The evidence on this issue is overwhelming, but not a shred of its supports this statement...	Study after study has shown that managers work at an unrelenting pace, that their activities are characterized by brevity, variety and discontinuity, and that they are strongly oriented to action and dislike reflective activities.
The effective manager has no regular duties to perform. Managers are constantly being told to spend more time planning and delegating, and less time seeing customers and engaging in negotiations. These are not, after all, the true tasks of the manager. To use the popular analogy, the good manager, like the good conductor, carefully orchestrates everything in advance then sits back to enjoy the fruits of his labor, responding occasionally to an unforeseeable exception...	In addition to handling exceptions, managerial work involves performing a number of regular duties, including ritual and ceremony, negotiations, and processing of soft information that links the organization with its environment.
The senior manager needs aggregated information, which a formal management information system best provides. Not too long ago, the words total information system were everywhere in the management literature. In keeping with the classical view of the manager as that individual perched on the apex of a regulated, hierarchical system, the literature's manager was to receive all his important information from a giant, comprehensive MIS...	Managers strongly favor the verbal media--namely, telephone calls and meetings. The evidence comes from every single study of managerial work...
Management is, or at least is quickly becoming, a science and a profession. By almost any definitions of science and profession, this statement is false...	The managers' programs--to schedule time, process information, make decisions, and so on--remain locked deep inside their brains. Thus, to describe these programs, we rely on words like judgment and intuition, seldom stopping to realize thay they are merely labels for our ignorance.

TYPICAL DEFINITION OF MIS

A SYSTEM DESIGNED TO PROVIDE TO MANAGEMENT, USEFUL INFORMATION IN THE NECESSARY TIMEFRAME TO MAKE DECISIONS AND TO TAKE EFFECTIVE ACTION IN PLANNING, STAFFING, DIRECTING AND CONTROLLING THE RESOURCES USED IN THE GENERAL CONDUCT OF AN ENTERPRISE.

Pepperdine University

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000-00-0000	01/16/59	ANYTOWN, CA	F

ADMITTED FROM: 12/02/78

21 08/31/78

DATE ADMITTED/SCHOOL:	MAJOR 1	MAJOR 2	DEGREE AWARDED, DATE:
06/25/76 SEAVER COLLEGE	BUS		

COMMENTS:

ENROLLED AT PEPPERDINE UNIV MALIBU

DEPT.	COURSE	COURSE TITLE	GRADE	UNITS ATTEMPTED	UNITS EARNED
FALL 76-77		09/09/76 - 12/17/76			
BA	151	ENVI OF THE ENTERPRISE	C	4.00	4.00
FA	101	INTRO TO FINE ARTS	C	4.00	4.00
LA	C99	BEGINNING GRAMMAR & COMP	C	4.00	4.00
PE	109	BEGINNING SWIMMING	W	1.00	
SOSC	105	MAN AND SOCIETY	W	4.00	
TRM ERN		12.00 AVGHR 12.00 GPTS	24.0 GPA		2.00
WINTER 76-77		01/04/77 - 04/14/77			
BA	224	FINANCIAL ACCOUNTING	D	4.00	4.00
LA	101	ENGLISH COMPOSITION	B	4.00	4.00
MATH	101	INTERMEDIATE ALGEBRA	B	4.00	4.00
REL	110	INTRODUCTION TO THE BIBLE	B	4.00	4.00
TRM ERN		16.00 AVGHR 16.00 GPTS	40.0 GPA		2.50

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DEPT.	COURSE	COURSE TITLE	GRADE	UNITS ATTEMPTED	UNITS EARNED
FALL 77-78		SEAVER COLLEGE 09/08/77 - 12/15/77			
BA	225	MANAGERIAL ACCOUNTING	F	4.00	
ECON	502	INTRODUCTORY STATISTICS	D	4.00	4.00
LA	110	BEGINNING TYPING	C	2.00	2.00
MATH	213	MATHEMATICAL FOUNDATIONS I	D	4.00	4.00
TRM ERN		10.00 AVGHR 14.00 GPTS	12.0 GPA		0.85
WINTER 77-78		SEAVER COLLEGE 01/04/78 - 04/14/78			
BA	225	MANAGERIAL ACCOUNTING	C	4.00	4.00
ECON	211	INTRO TO ECON PRINCIPLES	B	4.00	4.00
ECON	502	INTRODUCTORY STATISTICS	A	4.00	4.00
PE	100	PHYSICAL HEALTH SEMINAR	B	1.00	1.00
TRM ERN		13.00 AVGHR 13.00 GPTS	39.0 GPA		3.00
SPRING 77-78		SEAVER COLLEGE 04/24/78 - 06/15/78			
BA	224	FINANCIAL ACCOUNTING	C	4.00	4.00
LA	201	EFFECTIVE BUSINESS WRITING	B	4.00	4.00
TRM ERN		8.00 AVGHR 8.00 GPTS	20.0 GPA		2.50
PEP ERN		59.00 AVGHR 63.00 GPTS	135.0 GPA		2.14
CUM		59.00 63.00	135.0		2.14

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21.103 (2-77)

UNLESS OTHERWISE STATED, STUDENT IS IN GOOD STANDING.

OFFICIAL WHEN DATED, SIGNED AND SEALED.

SUMMARY

1) THE TYPICAL MIS IS BASED ON FAYOL'S 1916 DEFINITION OF THE FUNCTIONS OF MANAGEMENT.

2) BUSINESSES AS WELL AS UNIVERSITIES HAVE HAD THEIR SHARE OF MIS WOES, THEREFORE, LACK OF "BUSINESSLIKE" MANAGEMENT PRACTICE BY UNIVERSITIES IS NOT THE REASON FOR MIS PROBLEMS.

3) A DIFFERENT LOOK AT WHAT MANAGERS DO, I.E., MINTZBERG, LEADS TO A DIFFERENT VIEW OF MIS DESIGN.

THE AUTHORS WOULD SUGGEST:

4) ESTABLISHMENT OF INFORMATION OBJECTIVES FOR THE INSTITUTIONS.

5) USING THE OBJECTIVES, DETERMINE TYPE (DATA OR DECISION) OR MIX OF DATA/INFORMATION NEEDS ANALYSES TO BE CONDUCTED.

6) CONDUCT SUCH ANALYSES.

7) DESIGN AND DEVELOP THE INFORMATION SYSTEM THAT IS "RIGHT" FOR THE INSTITUTION/SITUATION.